Epitomes

Important Advances in Preventive Medicine and Public Health

Preventive Medicine and Public Health

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The Council on Scientific Affairs of the California Medical Association presents the following epitomes of progress in preventive medicine and public health. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, as to both scientific fact and important clinical significance. The items are presented in simple epitome, and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, researchers, and scholars to stay abreast of these items of progress in preventive medicine and public health that have recently achieved a substantial degree of authoritative acceptance, whether in their own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Preventive Medicine and Public Health of the California Medical Association, and the summaries were prepared under the direction of Dr. Peter Kerndt and the panel.

New Vaccines for Infectious Diseases

A NEW VACCINE against rotavirus (RotaShield, Wyeth-Lederle) has recently been licensed by the FDA. Licensure is expected for a new vaccine against Lyme disease in early 1999. Both vaccines will pose challenges to clinicians in recommending their use.

Rotavirus is the most common cause of severe childhood diarrhea, and is estimated to cause 50,000 hospitalizations each year in the United States among children less than 5 years of age. The new rotavirus vaccine is a live, oral, tetravalent preparation with strains of rhesus monkey rotavirus (RRV-1), three of which contain genes from human rotavirus serotypes. Vaccination results in an immune response to the four human rotavirus serotypes most commonly responsible for rotavirus-associated diarrhea in infants and young children. Vaccine trials indicate the vaccine is 70%–95% effective against severe rotavirus diarrhea and is extremely effective in preventing hospitalization due to rotavirus diarrhea.

The recommended dose schedule is 2, 4, and 6 months of age. Initiation of vaccination after 6 months of age is not recommended. The recommended dose is 2.5 cc reconstituted from lyophilized powder packaged in individual dose bottles. The lyophilized vaccine can be stored at room temperature.

The principal adverse reaction to rotavirus vaccine is fever, which may occur within 3–4 days of vaccination. Since initial vaccination is recommended at 2 months of age, vaccine-associated fever may result in some infants receiving extensive evaluation for fever.

The $114 cost for the three-dose series makes this vaccine the least cost-effective childhood vaccine now in use. A positive benefit-to-cost ratio is achieved only when considering indirect savings from reduced societal costs such as lost parental work time. The vaccine will likely be covered by the national Vaccines for Children entitlement program, which provides free vaccines to underinsured and Medicaid-eligible children. Routine use of rotavirus vaccines is endorsed by the U.S. Public Health Service Advisory Committee on Immunization Practices.

Two new recombinant Lyme disease (LD) vaccines (LYMErix, SmithKline Beecham, and ImuLyme, Pasteur Merieux Connaught) have recently been developed based on the outer surface protein Osp-A of *Borrelia burgdorferi,* and have been found to be 76% and 92% efficacious, respectively, in large field trials. Licensure for LYMErix is imminent. The apparent mechanism of the vaccines is to prevent spirochete transmission during tick attachment and feeding.

Both vaccines are administered as a series of three intramuscular injections at 0, 1, and 12 months. Immunogenicity and efficacy were lower in persons who received only two doses and/or were over 60–65 years of age. Local reactions at the site of inoculation were reported in approximately 30% of vaccinees. To date, no safety or efficacy studies of LD vaccine have been done in children less than 15 years old, pregnant women, or immunocompromised individuals.

In the West, the vector of LD is the western blacklegged tick, *Ixodes pacificus. I. pacificus* is most common in dense grassy or wooded areas, particularly in the northern coastal range and the western Sierra foothills of California. This species is uncommon in the Central Valley and south of the Tehachapi Mountains. The statewide proportion of *I. pacificus* infected with *B. burgdorferi* is comparatively low—approximately 2%–3% in adult ticks and 5%–6% in nymphs.

More than 85% of LD cases reported in the United States since 1982 are from the Northeast and Upper Midwest. The states with the greatest number of reported cases per 100,000 population in 1997 were Connecticut